

The Impact of Modern Technology on Education

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### **Abstract**

At present, technology is essential for everyone in their daily lives. The classroom is no exception to this rule. Within the last 15 years, the relationship between technology and education has grown tremendously. This article seeks to examine the impact of modern technology like LMS, 1:1 initiatives, and other computer-assisted teaching methods in the world of education. Data has shown that there are positives like increased engagement, and individualized learning as well as negatives such as increased cheating and security. The data reveals that there is an ever-constant need for the implementation and use of technology in schools to be closely monitored so that things like the cost associated with technology programs, skills training for students and teachers who are required to use and facilitate using various technological tools are consistently adjusted and considered.

### **The Impact of Modern Technology on Education**

As a collective, we should continuously study technology and its usage in education to gain insight into the impact of education in regards to academic performance and social-emotional health. It is imperative that we study this topic because constant changes in society have led to inevitable changes in education. One of the biggest today is innovations in technology and its continued usage in classrooms around the world. Schools and families around the world spend a substantial amount of money on computers, software, Internet connections, and other technology for educational purposes. The use of technology is ubiquitous in the educational system in most developed countries. For example, essentially all instructional classrooms in U.S. public schools have computers with Internet access (Bulman & Fairlie, 2016).

The Covid 19 pandemic shifted the entire nation and caused all classrooms to pivot seemingly overnight. Some never want to look back and others are struggling to keep up with newfound technology usage and its impact. I examined almost a dozen sources and in this review, I will share the importance of equity, training, social emotional health, as well as global learning and transformative classrooms. Highlighting the need for the positive impacts to be reinforced and the negative consequences to be reflected upon and dismantled to ensure continued success with technology within the classroom.

### **Literature Review**

#### **Cost/Implementation**

While technology is a major necessary part of education it is extremely costly the Department received \$30.75 Billion through the CARES Act. There is much flexibility in how CARES Act funding can be spent, including to support technological capacity and access – including hardware and software, connectivity, and instructional expertise – to support remote learning (*Funding digital learning* 2021). Districts heavily use technology funds to purchase learning software for students and staff. I have worked in 3 different districts and all three are 1-1 districts. Two of them prior to covid 19. Each district required use of district approved technology such as Promethean, smart boards and programs such as actively learn, read to achieve and/or I ready and others for consistent use in classrooms. In an often underfunded environment it's a breath of fresh air that so many schools are receiving funding to make the pivot to become more technologically advanced. It also raises the question: Does paying for technology take away from instructional time and resources like hiring additional teachers (Bulman & Fairlie, 2016)? Some teachers feel that the use of technology becomes more of a

management concern. “The time it takes to get students logged in and logged out during a station that is 15 minutes long” ends up taking up half of the station(Carstens et al., 2021).

While the 1:1 initiative is beneficial in the classroom, outside of the classroom some students are counted out. In the Durham County School District, for example, 22.7 percent of households don’t have access to high-speed internet that would allow students to participate in online instruction(*Digital Divide: An overview – public schools first NC*). Some will see this as a positive because 77% have access to the internet however this presents an equity issue in which the remaining 22 percent aren't able to complete assignments or access lessons outside of school.

#### Teacher readiness

Teachers are expected to utilize technology in the classroom. They are often encouraged to become facilitators and abandon traditional methods like lecture-driven teaching. Some teachers are hesitant and aren’t as accepting of the request. When asked what some of the biggest problems were with technology implementation, some teachers shared that

they feel more technology training would be beneficial for their students and themselves (Carstens et al., 2021). Despite the fact that lots of funding is used for technological advancement within schools some of the teachers feel that they are not adequately prepared. Although there are many new helpful programs available to assist struggling students, Kelli (2019) found that educators may not be using these intervention tools correctly therefore causing them to be ineffective. Without the proper training, teachers often use these types of tools as a “break” from teaching, while the student continues to work independently on the reading intervention program. Unfortunately, schools continue to rely on interventions that fail to address the needs of adolescent struggling readers (Kelli, 2019) (Strom, 2021). In order to make these tools effective, educators need

training on how and when to appropriately incorporate these tools into their lessons in order to increase student learning.(Strom, 2021).Teachers must know how to appropriately use technology before they are able to produce high quality education for their students. A study conducted by Morris & Loran (2014) found that posting on discussion boards and participating in conversation with classmates through an online learning management system had a negative impact on student engagement(Strom, 2021). Educators first need to be taught how to use and implement new tools before they are able to teach their students. Since many educators are not given enough professional development opportunities to keep up with the quickly changing world of technology, they are unfamiliar with or intimidated by technology(Strom, 2021). Without the proper training of teachers the use of technology in the classroom is not serving its intended purpose thus further skewing data in regards to whether or not programs are successful. The use of technological devices, programs and aids in the classroom should improve students' assessment performance, level of engagement, and academic success. However, these results depend directly on the self-efficacy, and continuous training of classroom teachers. When teachers are properly trained, and that training is conducted continuously, students do, in fact, benefit from the use of video technology in the classroom making class content more motivating and engaging. (Unser, 2017)

Teachers cannot focus on the technology alone when attempting to improve their lessons to enhance student engagement. The reality is, teachers are having a hard time keeping up with all of the drastic changes with educational technology tools (Strom, 2021).

### **Positive Impact on Student Learning**

Although technology is moving at a rapid pace and sometimes proves to be difficult for teachers there are several positives to student learning. Technology use in schools have been shown to yield results such as self paced learning that is usually difficult in whole groups and individualized instruction to aid with strengths and support weaknesses (Bulman & Fairlie, 2016). It additionally allows for faster remarks and stepped forward cooperative efforts among large groups of people. Category blogs and wikis widen the street for discussion and offer students an opportunity to participate outside of the room. Interactive whiteboards make teaching less difficult, giving students better visible aids and academics a better time in presenting lessons; whereas cell gadgets allow lecturers to supply data to college students in an extraordinarily lightning-fast manner(Simuforosa, 2013). Subrahmanyam et al (2000) posits that cognitive researchers suggest that for example, playing computer games can be an important building block in enhancing children's ability to read and visualize images. Playing specific computer and video games have been found to have immediate positive effects on specific cognitive skills. They may improve problem solving skills. Word processing and e-mail promote communication skills, database and spreadsheet programs promote organizational skills, and modeling software promotes understanding of science and Mathematics skills (Simuforosa, 2013).

Another study found that integrating technology and peer-led discussions of literature can produce increased student engagement and motivation. This type of technology is an accessible and motivational way to expose students to other ideas and cultures. These online literature discussions have the ability to create a sense of community and foster positive social interaction (Coffey, 2012)(Costley, 2014).

Computer based literacy programs have proven valuable in the observation and evaluation of ELLs in elementary and secondary classroom settings, offering many more accommodations than made previously available by the traditional “pencil and paper assessment” and assessment aids listed above. The most successful example cited in the article is the accommodation provided by the use of computer programming, in conjunction with some of the aids listed above (i.e. bilingual dictionaries, pop-up glossaries, read-aloud options, etc.) The use of the computer with these accommodations is effective because it provides the students with the help they need to be on the same level as their peers, in an accessible, user-friendly manner(Unser, 2017).

### **Negative Health Impact**

Even though there are excellent positives from implementing technology into the education curriculum it is not without its drawbacks. Some of which even pose health risks. According to the social learning theory, adolescents learn by observing and imitating what they see on the screen. The super-peer theory states that the media are like powerful best friends in sometimes making risky behavior seem like normal behavior. All this interferes with learning. Time flies while they are absorbed in the joy and curiosity produced by these websites and no time is left to conduct school tasks. This significant use of technology decreases students’ academic achievement. Absorption distracts from the main task of studying or homework preparation and impedes students’ concentration on assignments (Simuforosa, 2013).

When adolescents are exposed to computer games, television or other technological devices, this detracts from the quality of sleep adolescents experience and will lead to poor academic performance as day functioning will be affected. These findings seem to

be congruent with Zavodyny (2006) who asserts adolescents' increased use of modern technology has been accompanied by a decrease in amount of sleep and increase in attention difficulties and poorer academic achievement. Delmher cites a study by Wolfson and Carskadon (1998) who examined the effects of high school students regarding their sleeping habits. The results indicated that students who earned C's, D's and F's reported less sleep on school nights than students who earned A's and B's (Simuforosa, 2013).

With the 1:1 initiative comes an increased amount of screen time. Now that the majority of students have their own technology device, they now have the ability to use the device whenever they want and for as long as they want. This new sense of freedom is frequently abused. According to the Canadian Sedentary Behavior Guidelines, children are recommended to spend less than 2 hours per day watching a screened device (Faight, Ekwaru, Gleddie, Storey, Asbridge & Veugelers, 2017). Unfortunately, students usually spend over 2 hours per day staring at a device, and that is just to complete their school work (Scarpellini, et al., 2021)(Strom, 2021).

With schools transitioning to 1:1 within the classroom, they are increasing the amount of blue light exposure and indirectly harming student health. A study conducted in the Spring of 2021, by Scarpellini, et al. (2021), surveyed over 1500 mothers, and their children in elementary and middle school. The survey was created to determine what types of impact virtual schooling had on student learning. Results revealed that middle school students were spending several hours each day in front of a screen watching educational videos, playing interactive modules, and typing their assignments. In 2% of the students surveyed, there was an abuse of media use, with 8 -12 hours of screen time. Because of the COVID-19 pandemic, students were, and continue to be, spending more

than the recommended time in front of a screened device. These habits can result in severe mental health, physical health and learning struggles in developing children. The amount of screen time students are experiencing per day has a direct correlation to their emotions, behaviors and mental health(Strom, 2021).

Of the 1500 mothers surveyed, a majority (60.2%) observed behavioral changes in their children. The most frequently observed symptoms were restlessness (69.1%) and aggressiveness (33.3%), and anxiety (34.2%) (Scarpellini, et al., 2021). It is clear that children are in need of social interaction in order to maintain a sense of normalcy. Since children are still developing, the best way they know how to cope is through their negative emotions and behavior(Strom, 2021).

General health affects multiple aspects of students' lives, such as their academic achievement. This direct correlation between health and the ability to learn shows that technology use can be the "starting point" that allows students to spiral down a path of negative health choices, which will then affect their academic performance. When a student is low on sleep due to a technology addiction, it is much harder for them to comprehend what is being taught. The ability to learn requires focus from the entire body and brain. If a student is experiencing any distractions (tiredness, hunger, CVS, emotional stress, anxiety, depression, etc.), it is quite challenging for them to engage and understand the material being taught(Strom, 2021).

Lack of Focus: SMS or text messaging has become a favorite pastime of many students. Students are seen playing with their cell phone, iPhones day and night or driving and very often even between lectures. Being ever-connected to the online world has resulted in lack of focus

and concentration in academics and to some extent, even in sports and extracurricular activities(Raja & Nagasubramani , 2018).

### **Student Learning Negatives**

In addition to potential health risks associated with misuse of technology, there are also negative impacts in regard to student learning. Some of the negatives include limitations to students' creativity, increased distractions, and impaired reading and writing skills. Despite the fact that the delivery of countless information on the internet is a good getting to know device, it could kill creativity. Students normally replicate and paste the data in an effort to urge practical grades.This could be one in each of the saddest bad effects of generation on students(Carstens et al., 2021).

Handwriting and reading are impaired by typing and Information Technology (IT) brings about shallow processing of information. That is why students do not learn a lot from Google Books in the same fashion they do from printed books and magazines. Similarly, Carr (2011) accuses technology of causing our minds to be “shallow” and asserts that students who read linear texts have better understanding and a stronger memory than those who read via the internet(Alhumaid, 2019).

Another example of the negative effect of technological devices such as smartphones, tablets, PCs and laptops on students' performance is brought to us by Strain-Moritz (2016), an experienced teacher who ascertains that texting has negatively impacted students' ability to write full sentences, with no fragmentation or awkward punctuation. Alhusban (2016) also stipulates that classroom technologies drastically affect students' ability to write, notably when it comes to spelling and punctuation, grammatical

accuracy, spelling, proofreading, critical thinking, respect of coherence and linearity (Alhumaid, 2019).

Comment by Sarah Phinney, the distance learning coordinator at Porterville Adult School in Central California, shows the results of this digital divide as follows: In my seven years' experience working with this population [at Porterville Adult School], I have found that a great number of the students we serve, especially those who speak English as a second language, are computer illiterate and thus are on the lean side of the divide (Steele-Carlin, 2017)(Alhumaid, 2019). Even cheating has arisen as a threat with all of the advancements

Increasing Incidents of Cheating: Technological developments like graphical calculators, high tech watches, mini cameras and similar equipment have become great sources to cheat in exams. It is easier for students to write formulas and notes on graphing calculators, with least chances of being caught(Raja & Nagasubramani, 2018).

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Some [additional] of the negative consequences that can be raised with modern technologies include security, privacy, cost of education, loss of data by the students due to computer malfunctioning and other technical problems and so on(Vipin, 2021).

## Conclusion

In conclusion, studies proved that technology in education is inevitable and necessary. Students are being equipped with transferable 21st century skills. But it also identifies the need for the negatives to be addressed. There should be additional support and training in place for teachers and students who need assistance with any software or devices. There should be limitations on screen time and guidance on how to effectively implement technology in courses.

UNICEF (2017, p. 122) advises technology users to “Harness the good” and “limit the harm.” Wilkins (2014) provides a list of recommendations on how to handle technology in a way that would not be threatening to students. Her suggestions encompass: • Making sure learners to interact with each other even when immersed in their digital world, • Devising activities which necessarily promote communication and collaboration, • Sharing and comparing (blog posts, classroom projects ...) to see how technology can connect learners all around the world, • Encouraging tech-savvy students to design interactive content that would enrich the course .... Teacher training may also be another springboard whereon to stand when seeking to guarantee the appropriate use of technology. In fact, the more training teachers receive, the better way technology would be used and the less negative effects it would entail. Laurillard (2002) argues that to be effective, technology-based devices would not be effective unless their use is accompanied by appropriate pedagogical approaches. Similarly, McFarlane (1997) ascertains that integrating technology in teaching will not have the expected added value unless objectives are clearly set and tasks are well-designed(Alhumaid, 2019). Technology is not static. It constantly changes, bringing in new devices and sending others to obsolescence. Taking this aspect of technology in consideration involves

keeping up with that pace and aligning pedagogy with technology, thus harnessing hindrances and augmenting benefits(Alhumaid, 2019).

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